

WHAT IS CLAIMED IS:

1. A catalyst comprising a support comprising a sulfated oxide or hydroxide of at least one of the elements of Group IVB (IUPAC 4) of the Periodic Table, having deposited thereon; a first component selected from the group consisting of lutetium, ytterbium, thulium, erbium, holmium, terbium, combinations thereof, and yttrium;
5 and a second component comprising at least one platinum-group metal component.
2. The catalyst of Claim 1 wherein the first component comprises from about 0.01 to 10 mass-%, on an elemental basis, of the catalyst.
3. The catalyst of Claim 1 wherein the second component comprises from about 0.01
10 to 2 mass-%, on an elemental basis, of the catalyst.
4. The catalyst of Claim 1 wherein the element of Group IVB (IUPAC 4) comprises zirconium.
5. The catalyst of Claim 1 wherein the catalyst comprises from about 0.5 to 5 mass-% sulfur on an elemental basis.
- 15 6. The catalyst of Claim 1 wherein the atomic ratio of the first component to the second component is at least about 2.
7. The catalyst of Claim 1 further characterized in that it comprises from about 2 to 50 mass-% of a refractory inorganic-oxide binder.
8. The catalyst of Claim 7 wherein the refractory inorganic-oxide binder comprises
20 alumina.
9. The catalyst of Claim 1 wherein the first component consists essentially of one single lanthanide element component or a yttrium component and the second component consists essentially of one single metal selected from the platinum-group metals.
- 25 10. The catalyst of Claim 1 wherein the first component is ytterbium.
11. The catalyst of Claim 1 further comprising a third component selected from the group consisting of iron, cobalt, nickel, rhenium, and mixtures thereof.

12. The catalyst of Claim 11 wherein the third component is iron in an amount from about 0.1 to about 5 wt.%.
13. The catalyst of Claim 1 wherein the second component is platinum.
14. A process for the preparation of a catalyst suitable for hydrocarbon conversion comprising a sulfated support comprising at least one of the oxides and hydroxides of the elements of Group IVB (IUPAC 4) of the Periodic Table, a first component selected from the group consisting of at least one lanthanide-series element, mixtures thereof, and yttrium, and a second component selected from the group of platinum-group metals and mixtures thereof, the process comprising sulfating an oxide or hydroxide of at least one element of Group IVB (IUPAC 4) of the Periodic Table to form a sulfated support; depositing on the sulfated support, the first component; and depositing the second component to form said catalyst.
15. The process of Claim 14 wherein the first component and the second component are deposited sequentially.
16. The process of Claim 15 further comprising calcining after depositing the first component and calcining after depositing the second component.
17. The process of Claim 14 wherein the first component and the second component are deposited simultaneously.
18. The process of Claim 17 wherein the simultaneous depositing of the first component and the second component is accomplished using simultaneous impregnation, coprecipitation, or coextrusion.
19. A process for the preparation of a catalyst suitable for hydrocarbon conversion comprising a support comprising at least one of the oxides and hydroxides of the elements of Group IVB (IUPAC 4) of the Periodic Table, sulfate, a first component selected from the group consisting of at least one lanthanide-series element, mixtures thereof, and yttrium and a second component selected from the group of platinum-group metals and mixtures thereof, the process comprising depositing

sulfate on the support, depositing the first component on the support, and depositing the second component on the support to form said catalyst.

20. The process of Claim 19 wherein sulfate, the first component, and the second component are deposited on the support sequentially.
- 5 21. The process of Claim 20 further comprising calcining after depositing the first component and calcining after depositing the second component.
22. The process of Claim 19 wherein sulfate, the first component, and the second component are deposited on the support simultaneously.
23. The process of Claim 22 wherein the simultaneous depositing of sulfate, the first
10 component, and the second component is accomplished using simultaneous impregnation, coprecipitation, or coextrusion.